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Green Universities and Eco-Friendly Learning: From League Tables to Eco-Entrepreneurship Education.

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Abstract: The United Nations World Summit, 2005, advocated equipping students with the knowledge and understanding, skills and attributes needed to work and live in a way that safeguards environmental, social and economic wellbeing. 2014 marked the 10th and final year of the UN Decade for Education for Sustainable Development; with over two thirds of students surveyed believing that sustainable development should be covered in their degree courses (surveyed in 2010, 2011 and 2012, People & Planet, 2015). This paper outlines recent developments in incorporating green business, sustainable products and eco-entrepreneurship into HEI business school curricula. The focus is survey research of n=150 students at one HEI in the UK, and interviews with the Head of Estates and the Director of Student Engagement, to ascertain student attitudes towards the introduction of 'green business' modules; and the views of senior staff on student engagement in environmental improvements. The results are mapped onto two dimensions (interest in the environment and interest in a green module) and four conceptual domains (colour coded - red, yellow, light green, dark green) to exemplify the differentiation in student attitudes; and the concomitant need to develop different strategies for implementing curriculum development. Results indicate the majority of students in the sample displayed negative attitudes towards curriculum development in this regard. In general, red classified students ('cynical') tended to see curriculum development in this area as irrelevant; yellow ('instrumentalist') and dark green ('advocate') were more positive. Light green ('complacent') tended to feel they had enough environmental awareness without further curriculum development. Implications for curriculum development, student engagement, and plans for improving the green rating of the target HEI are provided by reviewing current KPI data against the top performing HEI in the UK (Green Planet index, 2015). The results are applicable to other HEIs across Europe.

Keywords: education for sustainable development, ESD, environmental education, EE, eco-entrepreneurship education, green business education, CSR education

1. Background to education for sustainable development

Sustainability is being integrated into higher-education institutions' mission and planning, curricula, research, student life and operations. Rowe, D (2007).

The UN Principles for Responsible Management Education (UNPRME, 2010) stress the need to transform organisational practices to reflect each business school's overall commitment to responsibility and sustainability. The initiative is viewed as one of the most important tools to inspire and champion responsible management education, research and thought leadership globally (Alcaraz and Thiruvattal, 2010, and Waddock et al, 2011).

Since its official launch in 2007 by UN Secretary-General Ban Ki-Moon, the initiative has grown to more than 500 leading business schools and management-related academic institutions from over 80 countries across the world. More than a third of the Financial Times' top 100 business schools are signatories to PRME.

Research by Godemann et al (2014) evaluates what has been achieved by 100 PRME adopting business schools and identifies issues that still need to be tackled such as with the ongoing need to integrate and facilitate change. Figure 1 summarises achievements and Figure 2 summarises issues that still need addressing.

The findings focus on strategic outcomes for business schools and set an agenda for further improvement. Nevertheless, these are the business schools that have reported considerable progress. What about those business schools that have not? This paper builds on the above findings by focussing on student attitudes towards curriculum development and towards student engagement on environmental issues at one HEI that still needs to make considerable progress in certain areas; and thus provides lessons to the many HEIs that still need to tackle the ESD agenda in full.

Outcome	Sustainability related offerings in the majority of business schools; interdisciplinary teaching seems to play an important role; focus on teaching methods such as guest speakers, case studies and competitions; tendency to put more effort in integrating sustainability at the postgraduate level; collaborative research is employed to enhance sustainability-related research but this is still not widespread; organisational practices are centred on environmental activities and community involvement.
Impact	Participating in the UNPRME initiative enhances the formalisation and development of strategic sustainability integration and transformation; business schools appear to choose the 'traditional' academic way of publishing about sustainability rather than creating impacts through contributions in other media; committing to continuous improvement and goal setting reveal the future impact of business school's activities.

Figure 1: Achievements, Godemann (2014)

Context	There is a will on the part of business schools to learn; only a few business schools explain their strategy for organisational learning; creating a climate for organisational change seems to require the right balance of top-down and bottom-up approaches; key approach to structural change involves the establishment of business school centres dedicated to or integrating sustainability.
Process	Only a few business schools provide insights into how they integrate sustainability (process); reviewing their own teaching, research and/or organisational practices to allow change to occur; the emphasis relies on the review of teaching; almost no account given for the establishment of a communication culture that brings organisation members together to learn from each other; providing financial incentives or input for staff is relatively rare.
Reflection	Great interest in sharing experience with others and learning from others as well as a need for support; only a few business schools yet provide a comprehensive account of their experience of integrating sustainability in their organisations; some business schools monitor other organisations, share best teaching practice and survey the faculty.

Figure 2: Facilitating integration and organisational change, Godemann (2014)

2. University league table results

One catalyst for change is when an HEI commits to a particular externally assessed rating of its achievements or performance in ESD. Example rankings for ESD provision include *Beyond Grey Pinstripes* (Aspen Institute, 2012) and the *People & Planet* index (2015). Any one of these acts as a form of league table with participants seeking to improve on their scores and move higher up the table. This allows observers to make objective and subjective comparisons of provision. Clearly the *Beyond Grey Pinstripes* ranking did have an impact on participants as *Pinstripes* data show that between 2001 and 2011, the percentage of MBA programs that required students to take courses dedicated to business and society themes increased from 34 percent to 79 percent. In fact, this success led to the measure being suspended. However, the main focus of *Pinstripes* was on MBA curricula.

The People & Planet University league tables (2015) focus on a broader measure of environmental and ethical performance. According to the People & Planet web site the index is the only comprehensive and independent league table of UK universities ranked by environmental and ethical performance. It is compiled annually by the UK's largest student campaigning network, People & Planet. 37.5% of all questions are assessed using data taken from the Estates Management Statistics, published every Spring by the Higher Education Statistics Agency (HESA). The remaining 62.5% of questions are asked through a survey which is issued as a freedom of information or environmental information request. Questions cover a broad range of issues around 14 themes as shown in figure three below.

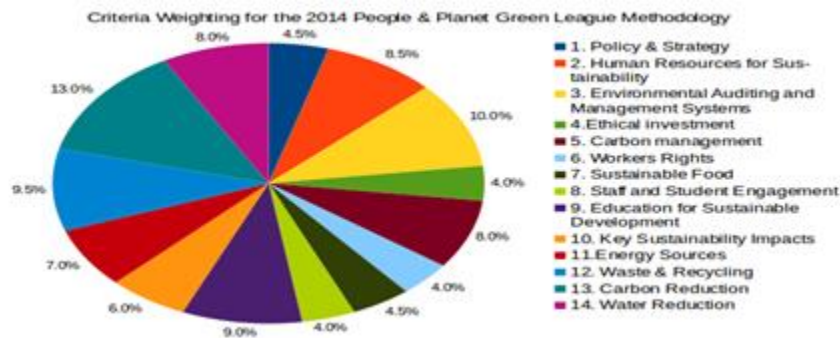


Figure 3: People and Planet green league criteria weighting 2014/2015.

For the purpose of this paper the results of one HEI will be compared to the top performing university in the People and Planet league table for 2015. This serves as a benchmark to ascertain areas that need to be addressed by lesser ranked universities. Thus Middlesex University were ranked 24th with a total score of 62.9% whereas Plymouth University were ranked 1st with a total score of 83%. The comparable results are displayed in figures 4 and 5 below.



Figure 4: Results for Middlesex University 2015, People & Planet (2015).



Figure 5: Results for Plymouth University 2015, People & Planet (2015)

The above comparisons indicate that Middlesex University scored particularly low for 'education' at 15% and low for 'engagement' also at 15% which will be discussed in more detail below. Two further dimensions: workers' rights and ethical investment are excluded from this study.

3. Focus on education and engagement

People and Planet (2015) argue that universities playing an active role in engaging students and staff in sustainable behaviour change will be able to make continual improvements in holistic sustainable development more smoothly, cheaply and quickly. However, People and Planet conclude that Middlesex University is NOT committed to student and staff engagement for sustainability through the development of a strategy or several strategies that include SMART targets and committing resources to continual improvement in this area. The results for Middlesex University are juxtaposed against Plymouth University in the table below to see more clearly areas that People & Planet identify can be improved.

Comparative results for Middlesex University and Plymouth University, People & Planet index 2015.	
Middlesex University	Plymouth University
Education for Sustainable Development (ESD). Overall score 15%.	Education for Sustainable Development (ESD). Overall score 100%.
Education for Sustainable Development is included within the portfolio of responsibilities of a member of the university senior management team. Score 15% (max 15%).	Education for Sustainable Development is included within the portfolio of responsibilities of a member of the university senior management team. Score 15% (max 15%). University Strategic Plan commits to developing and promoting Education for Sustainable Development. The university Teaching and Learning Strategy includes a commitment to Education for Sustainable Development. The university environmental/sustainability policy commits to the development and promotion of Education for Sustainable Development through the curriculum. Score 25% (max 25%).
Implementing and tracking progress in Education for Sustainable Development. Score 0% (max 30%).	The university has developed a framework or strategy for ESD which includes the following: The university has mapped ESD impact and activity areas across teaching and learning operations. The university has identified a mechanism for measuring and reporting on ESD which includes 'input' and 'output' indicators. The university is networking and sharing best practice in a self-defined community, e.g. EAUC and HEA Sustainability Higher Education Developers (SHED). The university has developed an ESD strategy/road-map and uses a framework to track progress and performance against an aspirational mission or vision e.g. LiFE index or EMS or T&L framework. The university supports student and staff engagement in ESD development. The university has a mechanism for reviewing and reporting on progress of the integration of Education for Sustainable Development into the curriculum. Score: 30% (max 30%).
Support and training to help all academic staff integrate Education for Sustainable Development into the curriculum. Score 0% (max 25%).	Creating spaces for dialogue, collaboration and participation around ESD (events, facilitated discussions, networking opportunities -open space / world cafe - working groups, academic talks or seminars). Provision of training in ESD. Inviting trade union representatives to participate in the development of ESD. Monitoring the uptake of staff training and development for ESD with resources for continual improvement. Allocating a number of Continuing Professional Development hours in ESD for academic staff. Supporting the development of resources for ESD. Score: 25% (max 25%).
Coursework linked to sustainability projects within the university/estates department (10%); The university supports and highlights School, Faculty or Research team projects for Education for Sustainable Development (10%). Score 0% (max 20%).	Coursework linked to sustainability projects within the university/estates department (10%). The university supports and highlights School, Faculty or Research team projects for Education for Sustainable Development (10%). Score: 20% (max 20%)
Staff and student engagement. Overall score 10%.	Staff and student engagement. Overall score 90%.

Comparative results for Middlesex University and Plymouth University, People & Planet index 2015.	
Middlesex University	Plymouth University
Highlight: Go Green Week.	Highlights: Plymouth University is committed to student and staff engagement for sustainability through the development of a strategy or several strategies that include SMART targets and commit resources to continual improvement in this area.
Staff inductions covering sustainability policy. Score 0% (max 15%).	All staff inductions cover university sustainability policy, issues and areas for staff engagement. Score 15% (max 15%).
Trade union reps or engagement with trade union on sustainability issues. Score 0% (max 10%).	Trade union reps or engagement with trade union on sustainability issues. Score 0% (max 10%).
Student representation on all university committees concerned with estates, planning, finance and resource allocation. Score 0% (max 5%).	Student representation on all university committees concerned with estates, planning, finance and resource allocation. Score 5% (max 5%).
Students' Union mapping, auditing and tracking annual progress of its impact areas. Score 5% (max 5%).	The Students' Union or Students' Association associated to the institution has achieved a Bronze, Silver, Gold or Green Impact Excellence Award in this year's Green Impact Union Awards or similar scheme. Score 5% (max 5%).

Figure 6: Results table comparing People & Planet (2015) league table scores (education, engagement) for Middlesex University versus Plymouth University

The above table clearly shows areas that need to be improved in order to achieve higher scores and concomitant increase in ranking position in the People and Planet league table. Whilst the results are relative they are based on best practice guidance (see People & Planet, 2015 and the conclusion to this paper) and therefore the author decided to evaluate student attitudes as regard ESD and to student engagement with environmental issues. The following research questions were posed.

4. Research questions (ESD)

- Have you taken any modules related to green business?
- Do you feel that you ought to have been offered a module in green business?
- To what extent do you feel that you have a good understanding of green business?
- To what extent do you feel green business or sustainability was adequately covered in other modules that you have taken?
- Had you been offered a module in green business would you have been interested in taking it?
- Had you been offered a module in sustainable products would you have been interested in taking it?
- Had you been offered a module in eco-entrepreneurship would you have been interested in taking it?

5. Research questions (student engagement)

- Are you aware of the environmental app SuMo?
- To what extent do you feel that a mobile application with an environmental component will engage students in environmental issues at Middlesex?
- To what extent do you feel that the above features (i.e. environmental challenges, games, news and updates) will improve your app experience?
- How green would you rate Middlesex University?
- How environmentally aware would you rate yourself?
- How easy is it to access environmental indicators (e.g. MDX green indicators)?
- To what extent do you pay attention to news related to environmental matters?
- To what extent do you already use apps?

6. Research questions (head of estates)

- What general role does Estates' play with Environmental Management at Middlesex University?
- How is MDX performing in terms of Environmental Management?
- What literature on environmental management in regards to universities could you recommend?
- The People & Planet league table highlighted Education & Student Engagement as two areas that needed improving. What is your advice for the university to improve these ratings?
- How do you think our mobile app would help?

7. Research questions (director of student engagement)

- What is the role of the Director of Student Engagement?
- What tools or techniques work the best?
- How can Middlesex University encourage students to take an interest in the environment and sustainability?
- What are your top tips in how to engage students?
- What are the current challenges preventing student engagement?
- How would you change an individual's behaviour e.g. engage a person in education?
- What literature on student engagement could you recommend?
- What opportunities do you see in using technologies to engage students?
- What is your opinion on using mobile applications as tools for engaging students?

8. Methodology

8.1 Questionnaires

Two questionnaires were delivered to n=150 students. The first questionnaire focussed on the student experience and attitudes towards introducing 'green' business modules into business school curricula. The second questionnaire concerned student attitudes towards engagement on environmental issues, primarily focussing on student experience of apps and their attitudes towards using an environmental app. The questionnaires used rating scales allowing for a clear range of responses on each item from 1-10. In addition, one open ended question was asked on each questionnaire allowing for more qualitative responses.

Items on the questionnaires might not have been familiar to all the respondents. For example, three potential modules were asked about: green business, sustainable products, eco-entrepreneurship; as these are modules planned to be delivered in the business school. However, students are unlikely to have more than a cursory understanding of the objectives, content or delivery of these modules. Thus, responses to the questionnaire should be treated with caution in this regard.

8.2 Interviews

Two interviews were conducted. The first interview was with the Head of Estates. Andrew Dickie is the most senior person in the university with direct experience and oversight of the university's Environmental Management System. He was also instrumental in providing information from Estates' for the People & Planet index. The second interview was with the Director of Student Engagement, Jacqui Boddington, whose role is to enhance the student experience through feedback and then to suggest initiatives to executives that might need prioritizing or re-prioritizing.

9. Results

9.1 Questionnaires

Results for the n=150 questionnaires (education) are displayed in figure 7. The results are mapped onto two dimensions (interest in the environment and interest in a green module) and four conceptual domains (colour coded - red, yellow, light green, dark green) to exemplify the differentiation in student attitudes.

Conceptual map of student eco attitudes (education)

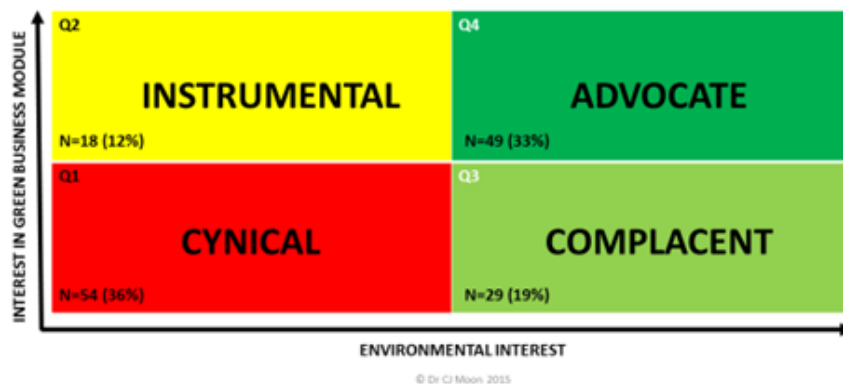


Figure 7: Conceptual map of n=150 student attitudes towards 'green' modules against their environmental interest

Results indicate the majority of students in the sample displayed negative attitudes towards curriculum development in this regard. In general, red classified students ('cynical') tend to see curriculum development in this area as irrelevant; yellow ('instrumentalist') and dark green ('advocate') were more positive. Light green ('complacent') tended to feel that they had enough environmental awareness without further curriculum development. Results for the second questionnaire are displayed in figure 8.

Conceptual map of student eco attitudes (engagement)

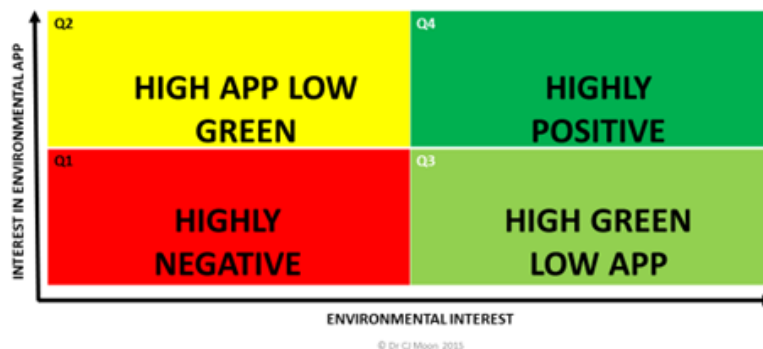


Figure 8: Conceptual map of n=150 student attitudes towards 'green' apps and engagement with environmental issues

Results for the questionnaire on student engagement have similarly been grouped into four quadrants. Similar to the questionnaire on education there is a majority of students expressing 'negative' attitudes towards both 'environmental awareness' and towards the relevance of an app to engaging students on environmental issues. However, there is a significant proportion of students that are highly 'positive' about being 'green' and about the usefulness of an app in this regard. Other students were either high 'green' / low app or high app / low 'green' in orientation.

The Results of the Interviews will not be displayed in full. However, References to Each of the Interviewee Comments will be made as Appropriate in the Discussion Section of this Paper.

10. Discussion

2014 marked the 10th and final year of the UN Decade for Education for Sustainable Development. Research by Godemann et al (2014) evaluated what had been achieved by 100 PRME adopting business schools and though

there is considerable progress much still needs to be tackled such as with the ongoing need to integrate and facilitate change.

A study carried out by the National Union of Students (NUS), the Higher Education Academy (HEA) and change Agents UK (People and Planet, 2015) showed that: over two thirds of students surveyed believe that sustainable development should be covered in their degree courses (surveyed in 2010, 2011 and 2012); and 80% of third year students (2,657 respondents) see universities as key actors in the delivery of skills for sustainable development.

The results of research conducted for this paper indicate that there is a significant proportion of students in favour of 'green' business modules. However, the largest proportion of students surveyed were 'cynical' about such provision. The author intends to study the questionnaire results more fully to analyse more precisely the potential reasons for this; such as through focus groups, etc.

Preliminary interpretation of the findings though is that, based on the n=150 students surveyed in this sample, different strategies are needed for teaching and learning depending on the different attitudes of students found. Students that were classified as 'cynical' (red quadrant) were exposed to a lecture by the author on strategic entrepreneurship including references to green business and eco-entrepreneurship; and approximately 50% of the red-rated students changed their attitude to the significance of 'green' business modules in business curricula. This implies that a compulsory session is useful but not sufficient to change all the apparent 'cynical' attitudes.

The author contends, therefore, that a compulsory core module (i.e. a series of sessions) is necessary to try and overcome these negative attitudes towards such an important topic. Some might contend that any business subject discipline can be argued to be necessary and ought to be core. However, given the importance of the sustainability agenda, and the UN recognition cited above, the author is of the informed opinion that all HEIs need to offer a core discipline in one of the 'green' business modules. Precisely what the content of this module should be and the form it should take needs further deliberation. However, best practice guidance is now available.

The results of this research also show that there is a significant proportion of students that are in favour of such 'green' modules. These, so-called 'advocates' indicated that they would choose an 'green' business module and appear to be less concerned as to the precise content and delivery mode. The author has classified these students as 'advocates' and they would appear to be satisfied by having a variety of 'green' business modules; and somewhat frustrated where they have not been given the opportunity to take such modules before graduating.

The results also suggest that there is a significant though smaller proportion of students that the author has classified as either 'complacent' or 'instrumental' in their orientation. The former appear to be generally in favour of 'green' business modules but lack the intensity of commitment expressed by the 'advocates'. The author contends therefore that one of the best methods to instil such interest is in providing opportunities for these students to be more actively engaged with the subject. By undertaking some practical activities this group of students should be able to develop their general interest into more specific commitment.

The latter group appear to be willing to undertake 'green' business modules if it is in their interest to do so. This pragmatic attitude is admired in business students to a degree. However, given the importance of values-based education the author contends that encouraging these students to reflect on their values might be a useful method to encourage less give-and-take attitudes and a greater recognition of responsibilities towards conserving the environment. And given that most new jobs in the UK are now in the 'green' economy this imperative needs to be recognised by business schools in general (Moon, 2013, 2014).

The survey research method can be criticised for only being a snapshot of attitudes at any given point in time; and the sample is constrained by being only of final year business students at one university. Nevertheless, the range of responses provided and the fact that the questionnaire was repeated does give an indication of face validity and some generalisability to other populations of students.

The results of the questionnaires pertaining to engagement are similarly mixed with the majority of students expressing 'negative' attitudes towards the environment. Of interest though is the potential for using an app to engage students more actively in environmental issues. Thus, 'positive' app attitudes appear to only be effective for those students already expressing an interest in environmental issues. The author recognises though that students in general had limited exposure to such types of app so far.

The interview with the Head of Estates confirmed the general view concerning student interest in environmental matters; that 'some students are very keen on it, whereas others are not really bothered.' Further, that 'there are some that are keen on it, but because they are only here for a short period of time, for individual students it's hard for them to get engaged.' And in response to whether an app would assist with student engagement Andrew Dickie stated: 'that would get the information across to the students more directly'. Andrew also acknowledged that the university has an internationally diverse population of students and indicators that are international might be best suited in this regard.

The interview with the Director of Student Engagement reinforced the need for educating students on environmental matters stating 'you need to educate people as to why it is important to them.' Jacqui Boddington also recognised the difficulty with engaging students on an individual basis by stating 'I think it's easier to engage groups, existing societies and people that are already connected around common things, cause it's really difficult to walk in a room on your own but it's much easier to walk in the room with someone else.' And 'the best educational experiences are not transactional but they are transformational and encourage engagement; and, that is, not only to get somebody to be like you, but it's actually about getting someone to contribute. Asking engaging questions and finding their motivations for action.' There were some reservations about the use of apps though: 'Not for everyone, it would for people that are like-minded. It's important to have their friends connect to it rather than those lots of people you don't know'.

The above interviewees partly placed responsibility on the students' union and student societies to engage students on environmental issues. There was less emphasis placed on the role of education in supporting student engagement.

11. Conclusions

Education for Sustainable Development is crucial for a society able to understand and tackle interlinked social and environmental problems. The university sector could and should be a major contributor to society's efforts to make the transition to a low-carbon socially just economy - through the skills and knowledge that its graduates learn and put into practice (People and Planet, 2015).

The People and Planet league table results indicate that a number of universities have been pioneering ways to promote Education for Sustainable Development throughout the curriculum, in subjects as diverse as engineering, history, art and music. Best practice guidance is provided by the Quality Assurance Agency for HE and Higher Education Academy Guidance for ESD; The Future Fit Framework (Prof. Stephen Sterling, and HEA); and various UNESCO publications.

This paper has surveyed the attitudes of n=150 students towards 'green' business modules; and their engagement with environmental issues. Results indicate the majority of students in the sample displayed negative attitudes towards curriculum development in this regard. In general, red classified students ('cynical') tend to see curriculum development in this area as irrelevant; yellow ('instrumentalist') and dark green ('advocate') were more positive. Light green ('complacent') tended to feel they had enough environmental awareness without further curriculum development.

Implications for curriculum development, student engagement, and plans for improving the green rating of the target HEI are provided by reviewing current KPI data against the top performing HEI in the UK (Green Planet index, 2015). The results are applicable to other HEIs across Europe.

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